REMARKS

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ohashi et al., U.S. Patent No. 6,376,345, in view of Matsuo et al., U.S. Patent No. 6,296,714.

Ohashi et al. neither discloses nor suggests irradiation with light having a wavelength of 500 nm to less than 1 μm for the purpose of reducing the electromotive force at the PN junction in a semiconductor substrate, thereby inhibiting galvanic effects due to photoexcitation before or after a step including chemical mechanical polishing (CMP).

Matsuo et al. teaches a step of washing a semiconductor substrate with a washing solution of an organic acid of pH2-4 while the substrate is irradiated with light having a wavelength of at least 500 nm. This photoirradiation generates a few carriers near the surface of the substrate, which reduces and dissociates an organic acid in the washing solution so that metal impurities react with the dissociated organic acid to form metal complex salts, whereby an effect of removing metal impurities near the substrate surface is enhanced. Thus, the Matsuo patent is directed to the removal of metal impurities by employing galvanic effects due to photoexcitation and a washing solution containing an organic acid, thereby converting the metal impurities to metal complex salts. The objects and effects of the Matsuo patent are just the opposite of those of the present invention.

Moreover, although the Ohashi and the Matsuo patents both have a washing (cleaning) step during photoirradiation, they are dissimilar in terms of the objects and effects, and the combination of Ohashi with Matsuo would not have occurred to those skilled in the art. Even if such a combination were found, radiating light having a wavelength of 500 nm to less than 1 μm for the purpose of reducing the electromotive force at the PN junction in a semiconductor

substrate, thereby inhibiting galvanic effects due to photoexcitation before or after a step including CMP, would not have occurred to those skilled in the art.

Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Ohashi et al., in view of Matsuo et al., and further in view of Klebanoff, U.S. Patent No. 6,169,652.

Klebanoff teaches an electrostatic chuck for holding a wafer or a substrate, which is not directly related to either cleaning or CMP. Therefore, it would be difficult to conceive of a combination of Klebanoff with Ohashi and Matsuo.

Although grounding of the chuck may contribute to prevention of static electricity and reduction of dust deposition, the effects of the present invention, namely reduction of the electromotive force at the PN junction in a semiconductor substrate and prevention of galvanic effects due to photoexcitation, would not be obvious. Accordingly, the combination of Klebanoff with Ohashi and Matsuo would not lead to the invention of claim 2.

Applicant notes the Examiner's Response to Arguments in paragraph 4 of the Office Action, and respectfully submits the following.

Ohashi teaches that a luminance of 500 lux or less is selected in order to keep the surface of a wafer wet during storage after anti-corrosion (cleaning) treatment. Ohashi does not suggest radiating light having a wavelength of 500 nm to less than 1 μm for the purpose of reducing the electromotive force at the PN junction in a semiconductor substrate, thereby inhibiting galvanic effects due to photoexcitation before or after a step including CMP. Even though Ohashi's teaching does not exclude the use of radiating light on a semiconductor substrate as asserted by the Examiner, irradiation with light having a wavelength of 500 nm to less than 1 μm would not have occurred to those skilled in the art.

The cleaning step disclosed by Ohashi et al. is an anti-corrosion treatment which is carried out following a planarization step, and it is aimed for removal of undesired chemicals, e.g., an oxidant which has been used during a polishing step. On the other hand, the aim of the cleaning process of the present invention is to prevent oxidation of the surface of wiring by means of irradiation with light. Although both cleaning steps share a common aim, radiating light having a wavelength of 500 nm to less than 1 μm would not have occurred to one skilled in the art.

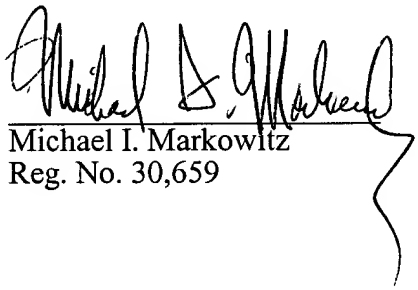
CLOSING

An earnest effort has been made to be fully responsive to the Examiner's objections. In view of the above amendments and remarks, it is believed that independent claim 1 is in condition for allowance, as well as those claims dependent therefrom. Passage of this case to allowance is earnestly solicited.

However, if for any reason the Examiner should consider this application not to be in condition for allowance, he is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper, not fully covered by an enclosed check, may be charged on Deposit Account 50-1290.

Respectfully submitted,



Michael I. Markowitz
Reg. No. 30,659

CUSTOMER NO.: 026304

Phone No.: (212) 940-8687
Fax No.: (212) 940-8986/7
ATTORNEY DOCKET NO.:NEKA 18.612
MIM:lh